

Scope of Services for Windows, Doors and Façades



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Testing of Windows, Doors and Façades



At the Entwicklungs- und Prüflabor Holztechnologie GmbH (EPH), the working area of windows, doors and façades comprises the evaluation of quality features of building elements and the proof of performance characteristics.

The test laboratory has at its disposal technical equipment to determine the following features: fitness for the intended use, mechanical strength/durability, operability, safety/burglar resistance, thermal insulation, climate resistance.

As a competent partner, we are at your service regarding the practical implementation of CE marking for windows and external pedestrian doorsets (product standard EN 14351-1) and façades (EN 438-7).

Range of services (extract)

Usability

- Air permeability
- Watertightness
- Resistance to wind load
 - EN 1026
 - EN 1027
 - EN 12211



Differential climate testing of windows

Mechanical strength

- EN 947
- EN 948
- EN 949
- EN 950
- EN 13049
- EN 14608
- EN 14609

Thermal insulation

- EN ISO 10077-1
- EN ISO 10077-2
- EN 12567-1; -2
- EN 12412-2

Mechanical durability

- EN 1191

Operating forces

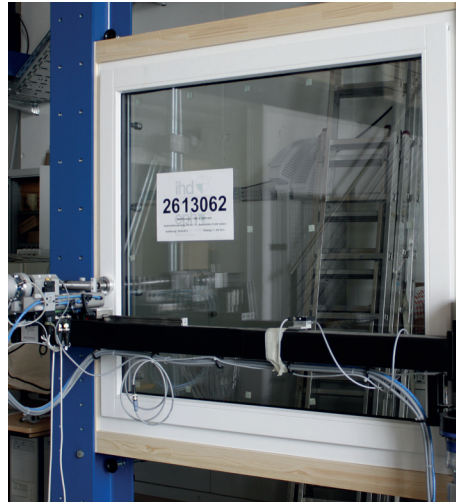
- EN 12046-1; -2

Mechanical burglary protection

- EN 1627ff

Hygrothermal characteristics

- EN 1121
- EN 1294
- EN 13420



Durability



Resistance to wind load



Deutsche
Akkreditierungsstelle
D-PL-11054-01-00

CE
Notified Body 0766



Testing of Burglar Resistance and Protection



Normative bases

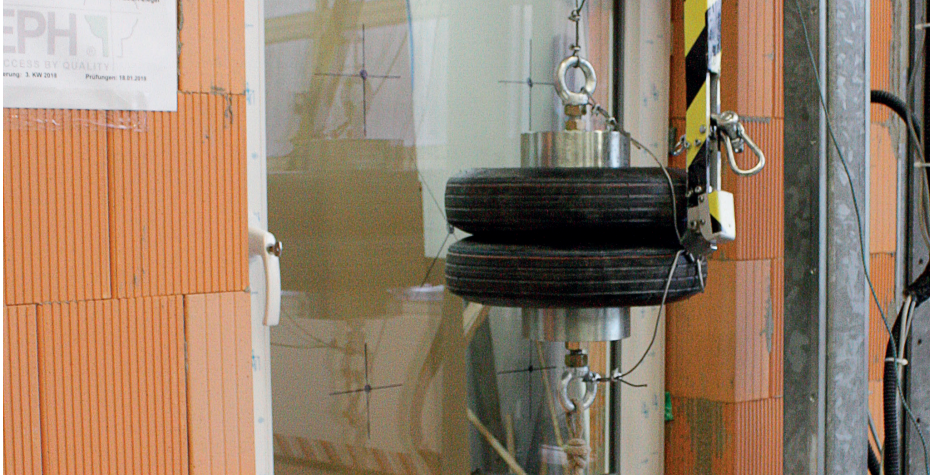
Testing of burglar resistance acc. to EN 1627-1630 at Entwicklungs- und Prüflabor Holztechnologie recognised by DIN CERTCO as inspection body for burglar resistance

Test procedures

- EN 1628
Determination of resistance under static load
- EN 1629
Determination of resistance under dynamic load
- EN 1630
Determination of resistance to manual burglary attempts



Dynamic load RC2



Testing of building elements for protection from falls

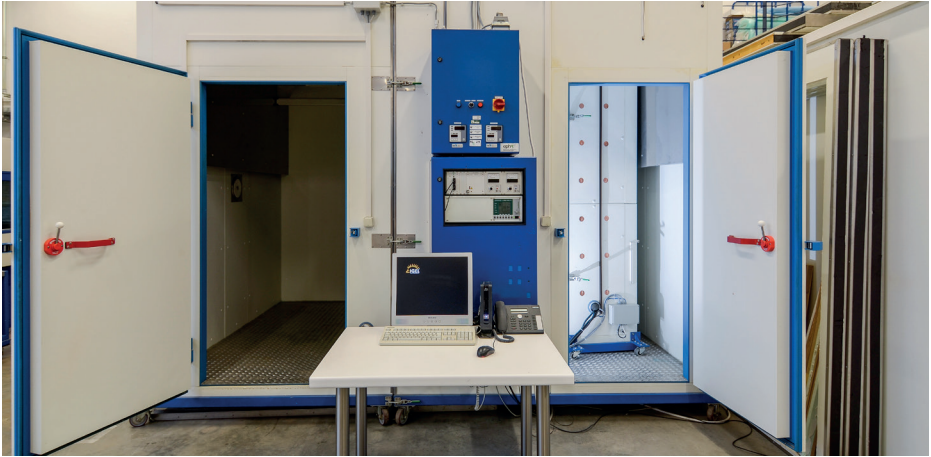


Typical test tools RC2/RC3



Manual burglary attempt

Thermal Insulation



Both national statutory regulations (EnEV 2014) and European standardisation (product standard EN 14351-1/A2) require to determine thermal transmittance coefficients (U values) of windows and doors. Regarding technical thermoprotective properties of windows and doors, the Entwicklungs- und Prüflabor Holztechnologie GmbH (Notified Body 0766) provides the following services:

Thermotechnical parameters

- Determination of material parameters (density, moisture, heat conductivity)
- Thermal transmittance coefficients
 - EN ISO 10077-1 windows, doors, shutters
 - EN ISO 10077-2 numerical methods for frames
 - EN ISO 6946 opaque door panels (entrance door panels)
- Thermal transmittance coefficients by hot-box method
 - EN ISO 12567-1 complete windows and doors
 - EN ISO 12567-2 roof windows
 - EN 12412-2 frames
 - EN ISO 8990 opaque door panels (entrance door panels)
- Determination of thermal protection characteristics for CE marking and EnEV-verifications

- Thermal bridge analyses
EN ISO 10211; EN ISO 10077-2
Assessment of the threat by dew water and mould in given environments (outdoor temperature, room temperature, relative humidity indoors): determination of PSI values, surface temperatures, isothermal circulation, critical surface moisture
- Thermal assessment of installation in the building shell (windows, external pedestrian doorsets, façade elements)
EN ISO 10211; DIN 4108-2; EN ISO 10077-2
Calculation of PSI values, temperature factors f_{Rsi} , thermal transmittance coefficients $U_{W,eingeb}$ and $U_{D,eingeb}$

Providing proof

- In its capacity as a notified body, the test laboratory (EPH) that is accredited according to ISO 17025 determines heat-protective parameters in accordance with the Construction Products Regulation (NB 0766) to prove agreement and conformity of building products and issues test certificates to document fulfilment of special quality features.



Isothermal progression in a post and mullion construction

Testing of Window Scantlings



Basic standards

- Wooden scantlings and semi-finished profiles for non-load-bearing applications
 - EN 13307-1
 - CEN/TS 13307-2
- Solid, finger-jointed and laminated profiles for wooden windows (ift Guideline ift-HO-10/1)

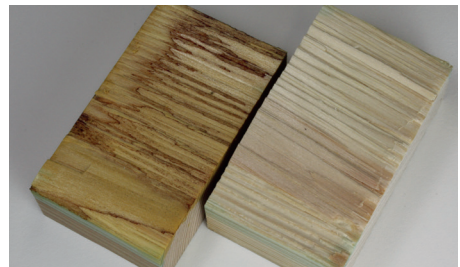
Test methods

- Determining the structure and wood species
- Testing of the laminar glueing
- Testing of the wood quality
- Testing of the swelling and shrinking behaviour
- Further mechanical and physical testing
- Testing of thermoprotective or moisture-protective properties
- Testing of frame corners
- Testing of finger joints

- Investigation of glued joints

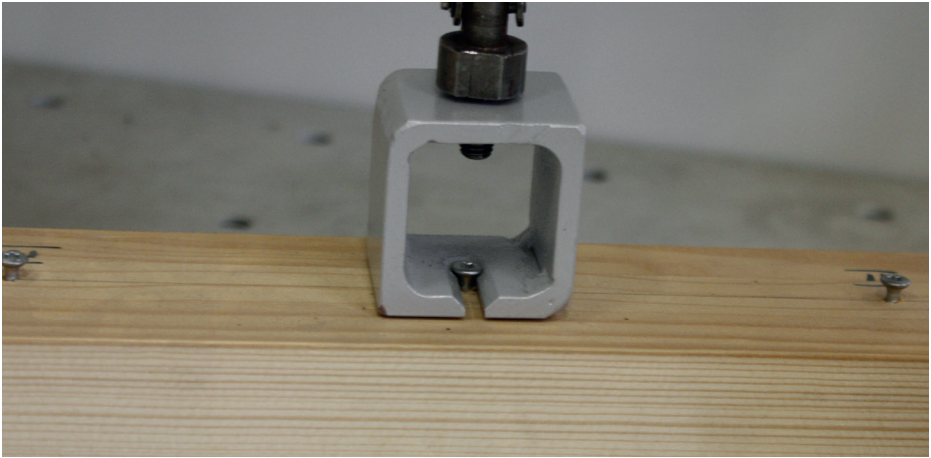
Proof of quality

- Quality assessments acc. to requirements of standards and guidelines
- Test certificates



Sample surfaces after puncture testing and colouration

Special Testing

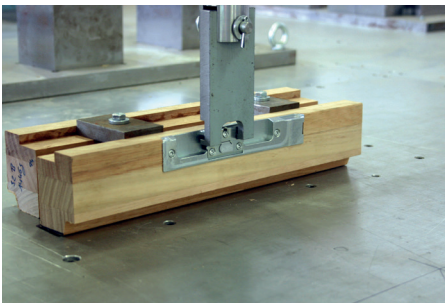


Testing of jointing and fastening means

- Pin-like jointing means
- Special nails, pallet nails
- Screws
- Holding capacity of fittings

Fall-protecting building elements

- Testing of balcony systems
- Testing of beam constructions
- Material-assessing testing of clamping and assembly elements

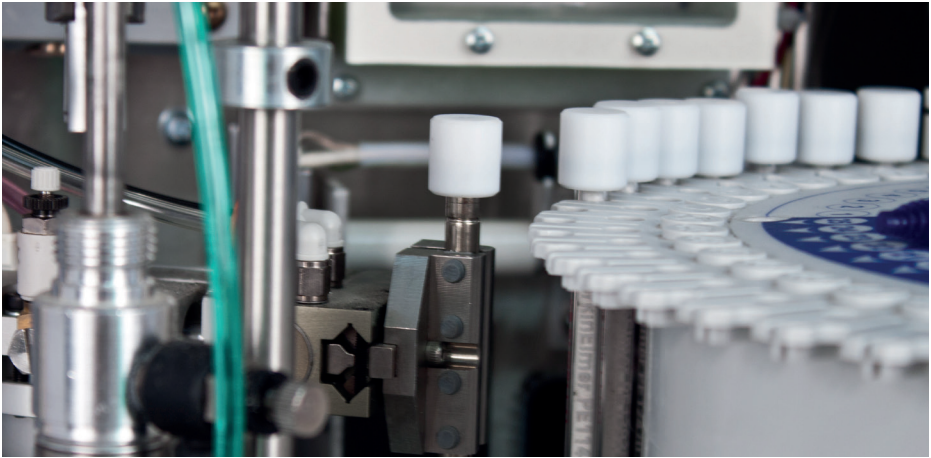


Testing the holding capacity of fittings



Testing of fall protection components

Surface Testing/Hygiene in the Living Space

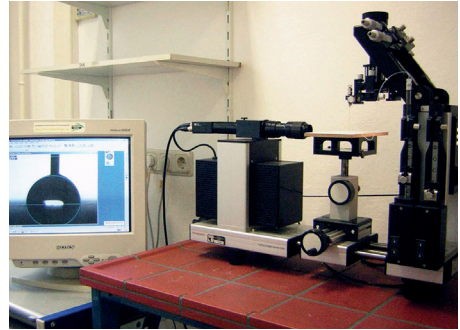


EPH services focus on surface-coating materials/surfaces

- Characterisation of substrate surfaces (e.g., wettability, conductivity, topography), Determination of the deformability of coatings
- Testing of coating materials (e.g., contents of VOC, in-can preservatives, pigments)
- Determination of curing degree of coatings
- Determination of surface properties of doors for interior use according to RAL requirements
- Sale of impact test devices for door edges according to RAL test method
- Migration behaviour of heavy metals
- Determination of surface resistance to mechanical and chemical impacts
- Determination of physical and moisture-related properties
- Determination of climatic, light and weathering resistance
- Emission measuring, e.g., acc. to RAL UZ, AgBB scheme
- Microscopic investigations
- Testing of the effectiveness of film protection and anti-bluestain agents
- Analysis of damaged coatings



Testing of effectivity of film protection agents in coatings according to EN 15457



Contact angle measurement

Usability and overview about properties*:

	Performance characteristics	Test method	Classification
Windows	Air permeability	EN 1026	EN 12207
	Watertightness	EN 1027	EN 12208
	Wind load	EN 12211	EN 12210
	Mechanical tests:		
	Vertical load	EN 14608	EN 13 115
	Static distortion	EN 14609	EN 13 115
	Impact resistance	EN 13049	EN 13049
Resistance to repeated uses	EN 11 91	EN 12400	
Operating forces	EN 12046-1	EN 13115	
Doors	Air permeability	EN 1026	EN 12207
	Watertightness	EN 1027	EN 12208
	Wind load	EN 12211	EN 12210
	Mechanical tests:		
	Vertical load	EN 947	EN 1192
	Static distortion	EN 948	EN 1192
	Soft body impact	EN 949	EN 1192
Hard body impact	EN 950	EN 1192	
Resistance to repeated uses	EN 11 91	EN 12400	
Operating forces	EN 12 046-2	EN 12217	

*(Scope of services EPH (extract))

Research Provided for Windows, Doors and Façades



Within the scope of assigned research (development-accompanying research, industrial research) and research by application (publicly funded single, joint or cooperation projects), the following main topics are processed by the Building Elements Department at the IHD:

- Improvement of surface properties by new processing methods
- Implementation of the principles of Universal Design in windows and doors
- New developments of building elements as well as single components that meet the requirements and the demand
- Analyses and technical solutions for the application of new materials in building elements
- Optimisation of product properties or expansion of the range of properties by combining several technical features
- Development and application of issue-related investigation and test methods including the required test equipment

Development of a Flood Protection Door



Project scope

- External door made of wood
- User-independent and permanent flood protection
- Integrated evacuation facility
- Maintenance of required basic properties

Target markets

- Existing building and listed building
- New building

Solution approach

- Moisture-resistant construction materials (oak, accoya)
- Waterproof coating system
- Sealing system according to requirements
- Special fitting solution for
 - High gasket pressure
 - Prevention of sludge entry into the construction
- Sufficient stop surface in the area of the threshold

Supported by:



Federal Ministry
for Economic Affairs
and Energy

on the basis of a decision
by the German Bundestag

Coating of Wood Surfaces



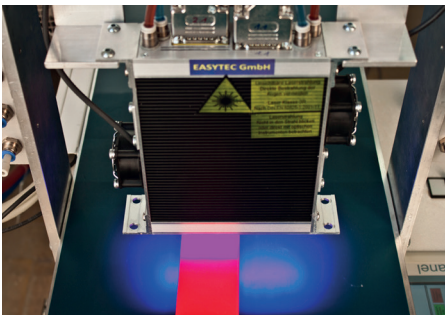
The IHD's department of Coating and Coating Materials focuses its research on digital printing, application, curing and drying methods for environmentally friendly coatings (powder,

water-borne and UV lacquers, waxes/oils), on improving surface properties, e.g., by applying the nanotechnology, or on the development of test methods.

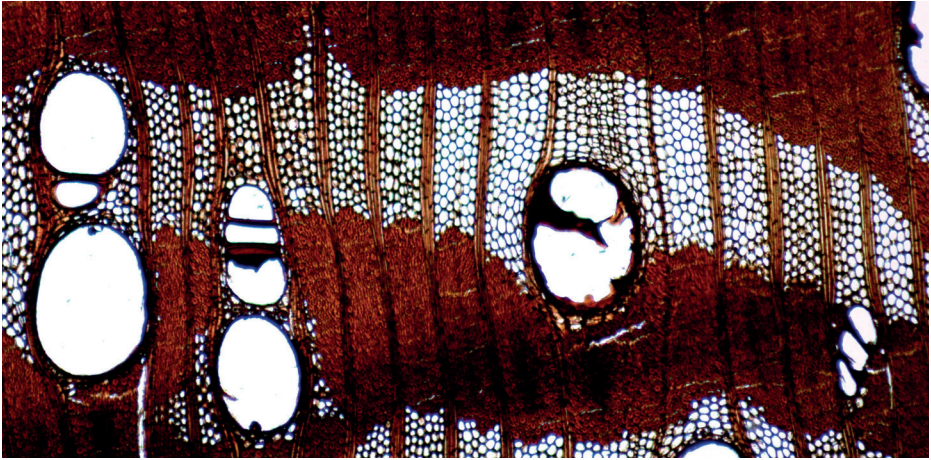
Focus of IHD research in the field of coating

- Powder-application methods for temperature-sensitive substrates (e.g., MDF, SMC, WPC)
- Direct-printing methods, e.g., digital printing

- Drying and curing technologies for water-borne and UV lacquers
- Natural coatings (waxes and oils)
- Application of nanotechnology to improve surface properties, such as protection from light or resistance to scratches, reaction to fire
- Development of test methods for surfaces (e.g., for emissions or resistance to micro-scratching)
- Improvement of the biological resistance of paints on wood
- Hydrophobing wood
- Fixation of wood-preserving agents, e.g., by soaking solid wood (vacuum-pressure method)



UV-LED curing facility at the IHD



Determination of wood species

- Pieces of art and cultural assets, items to be restored, archaeological artefacts
- Round and sawn timber, veneers, wood-based materials, wood products
- Small samples (chips, fibres)
- Proof of agreed species of wood
- Import control (CITES)

Structure, properties and use of wood species

- Wood-anatomical investigations
- Determination of wood properties
- Recommendations for application (also new species of wood, timber substitutes, modified timber)
- Determination of biological durability

Microscopic investigations

- Structure of layers, layer thickness, e.g., for the Decopaint directive
- Penetration depths and dispersion of surface-coating materials

Equipment

- Reflected light microscope, up to 400-fold
- Transmitted light microscope, up to 1,000-fold
- Fluorescent light and phase contrast
- Special preparation and dyeing methods
- Xylotheque (wood species collection) with referential samples of more than 2,000 wood species
- Special library with identification software
- Drying chamber, thermal chamber

Accreditations/Types of Quality Proof

- Entwicklungs- und Prüflabor Holztechnologie (EPH) with the PÜZ body for building parts of glass intended to protect from falling (being applied for) and European Notified Body for Building Products (Nr. 0766) also for windows, doors and façades.
- Test of performance characteristics for CE marking
- EPH-Quality sign „Quality proven“ on test certificates
- Laboratories for physical, chemical and biological testing accredited acc. EN ISO/IEC 17025:2005
- Product Certification Body accredited acc. to DIN EN ISO/IEC 17065
- Test Laboratory accredited by DIN CERTCO for burglar resistance



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